Firemen's Annuity and Benefit Fund of Chicago

GASB Statements Nos. 67 and 68
Accounting and Financial Reporting for Pensions
December 31, 2018

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May 28, 2019

The Retirement Board of the
Firemen's Annuity and Benefit Fund of Chicago
20 South Clark Street, Suite 1400
Chicago, Illinois 60654

Dear Members of the Board:

This report provides accounting and financial reporting information as of December 31, 2018, that is intended to comply with the Governmental Accounting Standards Board ("GASB") Statement Nos. 67 and 68 for the Firemen's Annuity and Benefit Fund of Chicago ("FABF" or "Fund"). These calculations have been made on a basis that is consistent with our understanding of these Statements.

GASB Statement No. 67 is the accounting standard that applies to the stand-alone financial reports issued by retirement systems. GASB Statement No. 68 establishes accounting and financial reporting for state and local government employers who provide their employees (including former employees) pension benefits through a trust.

Our calculation of the liability associated with the FABF benefits (described in Section E) was performed for the purpose of providing reporting and disclosure information that satisfies the requirements of GASB Statement Nos. 67 and 68. The Net Pension Liability is not an appropriate measure for measuring the sufficiency of plan assets to cover the estimated cost of settling the employer's benefit obligation. The Net Pension Liability is also not an appropriate measure for assessing the need for or amount of future employer contributions. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than FABF only in its entirety and only with the permission of FABF.

This report is based upon information, furnished to us by FABF, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. If the understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not audited.

This report complements the funding actuarial valuation report that was provided to FABF and should be considered in conjunction with that report. Please see the funding actuarial valuation report as of December 31, 2018, for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

Based on the recommendations included in the Economic Assumption Review, updated economic actuarial assumptions have been adopted by the Board effective beginning with the actuarial valuation as of December 31, 2018. Key economic actuarial assumption changes include decreasing the discount rate and investment return assumption from 7.50 percent to 6.75 percent, decreasing the wage inflation rate from 3.75 percent to 3.50 percent, and decreasing the general inflation rate from 2.50 percent to 2.25 percent. The demographic actuarial assumptions remain unchanged from the prior actuarial valuation and reflect the results of the experience study performed for the period from January 1, 2012, to December 31, 2016. The assumptions used are set forth in Section F: Actuarial Cost Method and Actuarial Assumptions of this actuarial valuation report.

The funding objective is to provide employer and employee contributions sufficient to provide the benefits of the Fund when due. Pursuant to Public Act ("P.A.") 99-0506, effective May 30, 2016, the funding policy was amended and requires City contributions to be equal to $199 million in payment year 2016, $208 million in payment year 2017, $227 million in payment year 2018, $235 million in payment year 2019, and $245 million in payment year 2020. For payment years after 2020, the City is required to make level percent of pay contributions for plan years 2020 through 2055, that along with member contributions and investment earnings, are expected to generate a projected funded ratio of 90 percent by plan year end 2055. The projections are based on an open group, level percent of pay financing and the Entry Age Normal cost method.

This is a severely underfunded plan. The funded ratio is only 16.8 percent (using market value of assets) and the unfunded liability is approximately $5.1 billion as of December 31, 2018. The funded ratio is not projected to even reach 50 percent funded for another 26 years until 2044. The ratio of assets as of December 31, 2018, to expected benefit payments for plan year 2019 is only 2.97.

The funding policy defined in P.A. 99-0506 provides for fixed dollar City contributions for payment years 2016 to 2020, and level percent of pay contributions for years 2021 to 2055 that, along with member contributions and investment income, are projected to produce a funded ratio of 90 percent by 2055. This funding policy significantly defers contributions when compared to the provisions of the prior funding policy defined in P.A. 96-1495. The amount of annual contributions defined under P.A. 99-0506 does not even cover normal cost plus interest on the unfunded liability for the next 13 years. This means the unfunded liability is actually projected to increase to a high of $5.6 billion in 2027, when contributions are finally sufficient to start reducing the unfunded liability.

We understand P.A. 99-0506 defines the amount of City contributions to FABF. Nevertheless, we continue to recommend that the plan sponsor seriously consider making additional contributions (in excess of the statutory requirement) to ensure that there are sufficient assets available in the fund in all years to pay the promised benefits.

We also recommend that the Board perform projections which include pessimistic scenarios such as investment return lower than assumed, lower contributions received than expected, higher benefit payments than expected, etc., to more fully understand the impact of less than optimal future expectations.

This actuarial valuation assumes that the City will be able to make future contributions on a timely basis. We did not perform an analysis of the ability of the City to make future contributions. Such an analysis is not within the scope of our assignment or within our analytical skill set. Failure to receive City contributions on a timely basis could jeopardize the sustainability of the Fund.

The actuarial valuation results set forth in this report are based on the data and actuarial techniques described above, and upon the provisions of the Fund as of the actuarial valuation date. To the best of our knowledge, the information contained in this report is complete and accurate based on the statutes in effect as of December 31, 2018, and fairly presents the actuarial position of the Fund as of December 31, 2018, for purposes of complying with the financial reporting requirements under GASB Statement Nos. 67 and 68. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

The actuarial assumptions used in this actuarial valuation are reasonable and appropriate for purposes of measuring the GASB Statement Nos. 67 and 68 pension liabilities as of December 31, 2018, under the current provisions.

This report should not be relied on for any purpose other than the purpose stated.

The signing actuaries are independent of the plan sponsor.

Alex Rivera and **Lance J. Weiss** are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

By Alex Rivera
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Senior Consultant

By Lance J. Weiss
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Senior Consultant

Auditor’s Note – This information is intended to assist in preparation of the financial statements of the Firemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor’s review. Please let us know if the auditor recommends any changes.

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Section A

Executive Summary

Executive Summary as of December 31, 2018

	2018
Actuarial Valuation Date	December 31, 2018
Measurement Date of the Net Pension Liability	December 31, 2018
Employer's Fiscal Year Ending Date (Reporting Date)	December 31, 2018
Membership	
Number of	
- Retirees and Beneficiaries	5,022
- Inactive, Nonretired Members	92
- Active Members	4,487
- Total	9,601
Covered Payroll	$ 456,969,301
Net Pension Liability	
Total Pension Liability	$ 6,252,360,385
Plan Fiduciary Net Position	1,035,790,339
Net Pension Liability	$ 5,216,570,046
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	16.57%
Net Pension Liability as a Percentage of Covered Payroll	1,141.56%
Development of the Single Discount Rate	
Single Discount Rate Beginning of Year	7.23%
Single Discount Rate End of Year	6.61%
Long-Term Expected Rate of Investment Return Beginning of Year	7.50%
Long-Term Expected Rate of Investment Return End of Year	6.75%
Long-Term Municipal Bond Rate Beginning of Year*	3.31%
Long-Term Municipal Bond Rate End of Year*	3.71%
Last Year Trust Assets are Available to Pay Benefits	2072
Total Pension Expense	$ 559,392,480

Deferred Outflows and Deferred (Inflows) of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred (Inflows) of Resources
Difference Between Expected and Actual Non-Investment Experience	$ 29,746,533	$ (49,660,656)
Changes in Assumptions	653,445,926	(36,341,534)
Net Difference Between Projected and Actual Earnings on Pension Plan Investments	133,804,468	(39,224,878)
Total	$ 816,996,927	$ (125,227,068)

*Source: *The rates at the beginning and end of the year are the rates for fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of December 29, 2017, and December 28, 2018, respectively. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax exempt securities.*

Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board ("GASB") Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain non-actuarial information, such as notes regarding accounting policies and investments, are not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to FABF subsequent to the measurement date of December 31, 2018.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The statement of fiduciary net position presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The statement of changes in fiduciary net position presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Discussion

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets and deferred outflows and inflows of resources related to pensions.

GASB Statement Nos. 67 and 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- A description of benefits provided by the plan;
- The type of employees and number of members covered by the pension plan;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The pension plan's investment policies;
- The pension plan's fiduciary net position, net pension liability and the pension plan's fiduciary net position as a percentage of the total pension liability;
- The net pension liability using a discount rate that is 1 percent higher and 1 percent lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the discount rates; and
- Certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- The composition of the pension plan's board and the authority under which benefit terms may be amended;
- A description of how fair value is determined;
- Information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5 percent, receivables and insurance contracts excluded from plan assets; and
- Annual money-weighted rate of return.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- Sources of changes in the net pension liability;
- Information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability and the net pension liability as a percent of covered-employee payroll; and
- A comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Discussion

Timing of the Actuarial Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least once every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of December 31, 2018, and a measurement date of December 31, 2018.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year mixed maturity general obligation bonds with an average AA credit rating (which is published by Fidelity) as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.75 percent; the municipal bond rate is 3.71 percent (based on the most recent date available on or before the measurement date from the "state & local bonds" rate from Federal Reserve statistical release(H.15)); and the resulting Single Discount Rate is 6.61 percent.

Effective Date and Transition

GASB Statement Nos. 67 and 68 are effective for fiscal years beginning after June 15, 2013, and June 15, 2014, respectively; earlier application is encouraged by the GASB.

Recent Legislation

The following Public Acts were passed in 2018 by the 100th General Assembly that made changes to the Fund Provisions, but did not impact the results of the actuarial valuation.

Public Act 100-1144 effective November 28, 2018

Authorizes a person to participate in the Chicago Firefighter Article if he or she (1) is or was employed and receiving a salary as a fireman, (2) has at least 5 years of service under the Chicago Firefighter Article, (3) is employed in a position covered under a specified provision of the Chicago Municipal Article relating to aldermen and members of the city council, (4) made an election under the Chicago Municipal Article to not receive service credit or be a participant under that Article, and (5) made an election to participate under the Chicago Firefighter Article. Defines salary for such a person as the lesser of (i) the salary associated with the highest career service rank under the Chicago Firefighter Article or (ii) the actual salary received by that person for service under a specified provision of the Chicago Municipal Article relating to aldermen and members of the city council.

Public Act 100-1148 effective December 10, 2018

Technical correction related to filing copies of the report as required by Section 3.1 of the General Assembly Organizational Act and with the State Government Report Distribution Center for the General Assembly.

Change in Assumptions

The actuarial assumptions have been changed since the last report to reflect the results of the Economic Assumption Review performed for the December 31, 2018, actuarial valuation. The demographic actuarial assumptions remain unchanged from the assumptions previously used for the Decembers 31, 2017, actuarial valuation.

Following is a summary of the actuarial assumptions adopted by the Board as a result of the most recent economic experience study:

Economic Assumptions

- **Price inflation**: Decrease the rate of price inflation from 2.50 percent to 2.25 percent.

- **Retiree Cost-of-Living Adjustment and Increases in the Pay Cap for Pensionable Pay for Participants Hired on and After January 1, 2011**: Decrease the assumed rate of COLA and increases in capped pay for participants hired on or after January 1, 2011, from 1.25 percent to 1.125 percent (½ of 2.25 percent).

- **Investment return**: Decrease the nominal investment return assumption from 7.50 percent to 6.75 percent.

- **General wage inflation and payroll growth assumption**: Maintain the productivity assumption of 1.25% and decrease the general wage inflation assumption from 3.75% to 3.50%. This assumption serves as the across-the-board portion of salary increases and the rate at which the pay at hire is assumed to increase in future years for projection purposes.

- **Salary increase**: Lower assumed salary increase rates on an aggregate basis. Rates were increased for members during the first three years of service and decreased for service greater than three years, with underlying wage inflation of 3.50 percent.

Section B

Financial Statements

Auditor’s Note: This information is intended to assist in preparation of the financial statements of the Firemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor’s review. Please let us know if the auditor recommends any changes.

Pension Expense under GASB Statement No. 68
Fiscal Year Ended December 31, 2018

A. Expense		
1. Service Cost Including Pension Plan Administrative Expense	$	97,143,246
2. Interest on the Total Pension Liability		410,821,674
3. Current-Period Benefit Changes		-
4. Employee Contributions (made negative for addition here)		(45,894,781)
5. Projected Earnings on Plan Investments (made negative for addition here)		(83,269,835)
6. Other Changes in Plan Fiduciary Net Position		(5,853)
7. Recognition of Outflow/(Inflow) of Resources due to Liabilities		(2,136,567)
8. Recognition of Outflow/(Inflow) of Resources due to Assumption Changes		149,626,948
9. Recognition of Outflow/(Inflow) of Resources due to Assets		33,107,648
10. Total Pension Expense	**$**	**559,392,480**
B. Reconciliation of Net Pension Liability		
1. Net Pension Liability Beginning of Year	**$**	**4,619,996,691**
2. Pension Expense		559,392,480
3. Employer Contributions (made negative for addition here)		(249,684,038)
4. Change in Liability Experience Outflows/(Inflows) Recognized in Current Liabilities		(54,281,312)
5. Change in Assumption Changes Experience Outflows/(Inflows) Recognized in Current Liabilities		232,983,805
6. Change in Investment Experience Outflows/(Inflows) Recognized in Current Assets		108,162,420
7. Net Pension Liability End of Year	**$**	**5,216,570,046**

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods
Fiscal Year Ended December 31, 2018

A. Outflows and (Inflows) of Resources Recognized in Current and Future Pension Expenses as of Plan Year End December 31, 2018

Experience (Gain)/Loss	Original Balance	Date Established	Original Recognition Period/ Amortization Factor	Amount Recognized in Past Pension Expenses	Amount Recognized in Current Pension Expense	Deferred (Inflows) to be Recognized in Future Pension Expenses	Deferred Outflows to be Recognized in Future Pension Expenses
1. Differences Between Expected	$ (56,417,879)	December 31, 2018	5.9966	$ -	$ (9,408,311)	$ (47,009,568)	$ -
and Actual Non-Investment Experience	26,954,338	December 31, 2017	5.9972	4,494,487	4,494,487	-	17,965,364
	24,110,158	December 31, 2016	5.8667	8,219,326	4,109,663	-	11,781,169
	(7,980,712)	December 31, 2015	5.9897	(3,997,218)	(1,332,406)	(2,651,088)	-
	$ (13,334,095)		5.9626	$ 8,716,595	$ (2,136,567)	$ (49,660,656)	$ 29,746,533
2. Assumption Changes	$ 382,610,753	December 31, 2018	5.9966	$ -	$ 63,804,615	$ -	$ 318,806,138
	414,218,762	December 31, 2017	5.9972	69,068,692	69,068,692	-	276,081,378
	(74,372,930)	December 31, 2016	5.8667	(25,354,264)	(12,677,132)	(36,341,534)	-
	176,281,502	December 31, 2015	5.9897	88,292,319	29,430,773	-	58,558,410
	$ 898,738,087		5.9626	$ 132,006,747	$ 149,626,948	$ (36,341,534)	$ 653,445,926
3. Difference Between Expected	$ 141,270,068	December 31, 2018	5.0000	$ -	$ 28,254,014	$ -	$ 113,016,054
and Actual Investment Earnings	(65,374,796)	December 31, 2017	5.0000	(13,074,959)	(13,074,959)	(39,224,878)	-
	14,299,119	December 31, 2016	5.0000	5,719,648	2,859,824	-	5,719,647
	75,343,843	December 31, 2015	5.0000	45,206,307	15,068,769	-	15,068,767
	$ 165,538,234		5.0000	$ 37,850,996	$ 33,107,648	$ (39,224,878)	$ 133,804,468
4. Total	**$ 1,050,942,226**			**$ 178,574,338**	**$ 180,598,029**	**$ (125,227,068)**	**$ 816,996,927**

B. Deferred Outflows and Deferred (Inflows) of Resources by Year to be Recognized in Future Pension Expenses

Year Ending December 31	Differences Between Expected and Actual Non-Investment Experience	Assumption Changes	Differences Between Expected and Actual Investment Experience
2019	$ (2,136,567)	$ 149,626,948	$ 33,107,646
2020	(2,122,843)	149,323,812	18,038,878
2021	(1,351,981)	121,886,037	15,179,054
2022	(4,926,408)	132,679,917	28,254,012
2023	(9,376,324)	63,587,678	-
Thereafter	-	-	-
Total	**$ (19,914,123)**	**$ 617,104,392**	**$ 94,579,590**

Year Ending December 31	Deferred Outflows of Resources	Deferred (Inflows) of Resources	Net Deferred Outflows/ (Inflows) of Resources
2019	$ 217,090,835	$ (36,492,808)	$ 180,598,027
2020	201,718,931	(36,479,084)	165,239,847
2021	169,183,651	(33,470,541)	135,713,110
2022	165,415,832	(9,408,311)	156,007,521
2023	63,587,678	(9,376,324)	54,211,354
Thereafter	-	-	-
Total	**$ 816,996,927**	**$ (125,227,068)**	**$ 691,769,859**

Statement of Fiduciary Net Position
Years Ended December 31, 2018, and 2017

	2018	2017
Assets		
Receivables		
Employer contributions - net	$ 246,112,696	$ 222,194,272
Investment income	2,624,486	2,559,800
Other receivables	2,574,616	3,090,610
Securities lending	57,196	88,334
Unsettled trades	4,433,658	4,790,998
Total receivables	255,802,652	232,724,014
Prepaid expenses	173,473	165,861
Investments - at fair value		
Cash deposits and short-term investments	24,454,811	46,195,477
Corporate bonds	109,211,831	121,812,826
Equities	494,106,560	617,148,695
Pooled funds	65,409,809	31,170,538
Private equity and venture capital	13,303,807	16,485,995
U.S. and Foreign Governmental obligations	81,437,455	68,387,838
Subtotal	787,924,273	901,201,369
Collateral held for securities on loan	91,416,894	111,709,566
Total investments - fair value	879,341,167	1,012,910,935
Total assets	1,135,317,292	1,245,800,810
Liabilities and net position		
Liabilities		
Accounts payable and accrued expenses	88,401	1,342,608
Participant accounts	580,944	519,101
Securities lending collateral	91,416,894	111,709,566
Securities lending	14,275	22,063
Unsettled trades	7,426,439	6,054,158
Total liabilities	99,526,953	119,647,496
Net Position - Restricted for Pension Benefits	$ 1,035,790,339	$ 1,126,153,314

Statement of Changes in Fiduciary Net Position
Years Ended December 31, 2018, and 2017

	2018	2017
Additions		
Contributions		
Employer	$ 249,684,038	$ 228,452,611
Plan Member	45,894,781	47,364,276
Total Contributions	295,578,819	275,816,887
Investment Income		
Net appreciation in fair value of investments	(75,968,716)	125,047,682
Interest	10,877,857	8,864,708
Dividends	12,303,951	11,491,614
	(52,786,908)	145,404,004
Less investment expenses	(5,859,855)	(5,493,881)
Investment income - net	(58,646,763)	139,910,123
Securities lending		
Income	2,589,960	1,766,076
Lender (borrower) rebates	(1,792,673)	(970,095)
Management fees	(199,050)	(198,702)
Securities lending income - net	598,237	597,279
Gift Fund donations	3,580	4,330
Miscellaneous income	2,273	18,549
Tax levy interest	48,293	13,543
Interest on Lewis settlement	-	48,911
Total additions	237,584,439	416,409,622
Deductions		
Benefits	320,595,085	302,518,486
Refunds	4,067,219	3,579,629
Administrative expenses	3,285,110	3,171,986
Total deductions	327,947,414	309,270,101
Net increase	(90,362,975)	107,139,521
Net Position Restricted for Pension Benefits		
Beginning of year	1,126,153,314	1,019,013,793
End of year	$ 1,035,790,339	$ 1,126,153,314

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor’s Note: This information is intended to assist in preparation of the financial statements of the Firemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor’s review. Please let us know if the auditor recommends any changes.

Statement of Changes in Net Pension Liability and Related Ratios Current Period
Fiscal Year Ended December 31, 2018

A. Total Pension Liability		
1. Service Cost Including Pension Plan Administrative Expense	$	97,143,246
2. Interest on the Total Pension Liability		410,821,674
3. Changes of benefit terms		-
4. Difference between expected and actual experience of the Total Pension Liability		(56,417,879)
5. Changes of assumptions		382,610,753
6. Benefit payments, including refunds of employee contributions		(324,662,304)
7. Pension Plan Administrative Expenses		(3,285,110)
8. Net change in total pension liability		506,210,380
9. Total pension liability – beginning		5,746,150,005
10. Total pension liability – ending	**$**	**6,252,360,385**
B. Plan Fiduciary Net Position		
1. Contributions – employer	$	249,684,038
2. Contributions – employee		45,894,781
3. Net investment income		(58,000,233)
4. Benefit payments, including refunds of employee contributions		(324,662,304)
5. Pension Plan Administrative Expense		(3,285,110)
6. Other		5,853
7. Net change in plan fiduciary net position		(90,362,975)
8. Plan fiduciary net position – beginning		1,126,153,314
9. Plan fiduciary net position – ending	**$**	**1,035,790,339**
C. Net Pension Liability	**$**	**5,216,570,046**
D. Plan Fiduciary Net Position as a Percentage of the Total Pension Liability		**16.57%**
E. Covered-Employee Payroll	**$**	**456,969,301**
F. Net Pension Liability as a Percentage of Covered Employee Payroll		**1141.56%**

Statement of Required Supplementary Information
Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Fiscal year ending December 31,	2018	2017	2016	2015	2014
Total Pension Liability					
Service Cost Including Pension Plan Administrative Expense	$ 97,143,246	$ 93,366,729	$ 94,115,473	$ 87,203,153	$ 83,095,601
Interest on the Total Pension Liability	410,821,674	371,622,080	342,084,603	338,986,636	329,965,941
Benefit Changes	-	-	227,212,695	-	-
Difference between Expected and Actual Experience	(56,417,879)	26,954,338	24,110,158	(7,980,712)	-
Assumption Changes	382,610,753	414,218,762	(74,372,930)	176,281,502	88,448,895
Benefit Payments	(320,595,085)	(302,518,486)	(283,085,767)	(274,459,754)	(261,571,672)
Refunds	(4,067,219)	(3,579,629)	(3,673,250)	(3,557,317)	(2,321,666)
Pension Plan Administrative Expense	(3,285,110)	(3,171,986)	(3,216,823)	(3,149,549)	(3,069,192)
Net Change in Total Pension Liability	506,210,380	596,891,808	323,174,159	313,323,959	234,547,907
Total Pension Liability - Beginning	5,746,150,005	5,149,258,197	4,826,084,038	4,512,760,079	4,278,212,172
Total Pension Liability - Ending (a)	$ 6,252,360,385	$ 5,746,150,005	$ 5,149,258,197	$ 4,826,084,038	$ 4,512,760,079
Plan Fiduciary Net Position					
Employer Contributions	$ 249,684,038	$ 228,452,611	$ 154,101,396	$ 236,104,362	$ 107,334,399
Employee Contributions	45,894,781	47,364,276	48,959,929	46,552,247	48,056,393
Pension Plan Net Investment Income	(58,000,233)	140,569,856	60,881,106	7,595,562	30,867,889
Benefit Payments	(320,595,085)	(302,518,486)	(283,085,767)	(274,459,754)	(261,571,672)
Refunds	(4,067,219)	(3,579,629)	(3,673,250)	(3,557,317)	(2,321,666)
Pension Plan Administrative Expense	(3,285,110)	(3,171,986)	(3,216,823)	(3,149,549)	(3,069,192)
Other	5,853	22,879	(53,891)	7,141	7,393
Net Change in Plan Fiduciary Net Position	(90,362,975)	107,139,521	(26,087,300)	9,092,692	(80,696,456)
Plan Fiduciary Net Position - Beginning	1,126,153,314	1,019,013,793	1,045,101,093	1,036,008,401	1,116,704,857
Plan Fiduciary Net Position - Ending (b)	$ 1,035,790,339	$ 1,126,153,314	$ 1,019,013,793	$ 1,045,101,093	$ 1,036,008,401
Net Pension Liability - Ending (a) - (b)	5,216,570,046	4,619,996,691	4,130,244,404	3,780,982,945	3,476,751,678
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	16.57%	19.60%	19.79%	21.66%	22.96%
Covered Employee Payroll	$ 456,969,301	$ 469,407,281	$ 478,470,944	$ 465,231,594	$ 460,189,982
Net Pension Liability as a Percentage of Covered Employee Payroll	1,141.56%	984.22%	863.22%	812.71%	755.50%

Ten fiscal years will be built prospectively.
Please see the following page for additional notes relating to the Schedule of Changes in Net Pension Liability and Related Ratios.

Schedules of Required Supplementary Information Additional Notes to the Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Beginning of year total pension liability for fiscal year 2018 used a Single Discount Rate of 7.23 percent and the benefit provisions and funding policy in effect as of the December 31, 2017, funding actuarial valuation. The Single Discount Rate of 7.23 percent was based on a long-term expected rate of return on pension plan investments of 7.50 percent used in the December 31, 2017, funding actuarial valuation for the years 2017 through 2070, and a long-term municipal bond rate as of December 29, 2017, of 3.31 percent for subsequent years.

End of year total pension liability for fiscal year 2018 uses a Single Discount Rate of 6.61 percent and the benefit provisions and funding policy in effect as of the December 31, 2018, funding actuarial valuation. The Single Discount Rate of 6.61 percent was based on a long-term expected rate of return on pension plan investments of 6.75 percent used in the December 31, 2018, funding actuarial valuation for the years 2018 through 2072 and a long-term municipal bond rate as of December 28, 2018, of 3.71 percent for subsequent years.

The increase in the total pension liability for fiscal year 2018 due to actuarial assumption and method changes reflects the following changes in economic assumptions:

- Decrease in interest rate from 7.50 percent to 6.75 percent, decrease in wage inflation from 3.75 percent to 3.50 percent, and decrease in price inflation from 2.50 percent to 2.25 percent.
- Increase in the long-term municipal bond rate from 3.31 percent as of December 29, 2017, to 3.71 percent as of December 28, 2018.
- Decrease in Single Discount Rate from 7.23 percent as of December 31, 2017, to 6.61 percent as of December 31, 2018.

Schedules of Required Supplementary Information
Schedule of the Net Pension Liability Multiyear

FY Ending December 31,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll*	Net Pension Liability as a % of Covered Payroll
2014	$ 4,512,760,079	$ 1,036,008,401	$ 3,476,751,678	22.96%	$ 460,189,982	755.50%
2015	4,826,084,038	1,045,101,093	3,780,982,945	21.66%	465,231,594	812.71%
2016	5,149,258,197	1,019,013,793	4,130,244,404	19.79%	478,470,944	863.22%
2017	5,746,150,005	1,126,153,314	4,619,996,691	19.60%	469,407,281	984.22%
2018	6,252,360,385	1,035,790,339	5,216,570,046	16.57%	456,969,301	1,141.56%

** Covered payroll is the amount in force as of the valuation date and likely differs from actual payroll paid during the fiscal year.*

Ten fiscal years will be built prospectively.

Schedules of Contribution Multiyear
Last 10 Fiscal Years

FY Ending December 31,	Actuarially Determined Contribution*	Actual Contribution	Contribution Deficiency/ (Excess)	Covered Payroll**	Actual Contribution as a % of Covered Payroll	Statutory Contribution***
2009	$ 203,866,919	$ 89,211,671	$ 114,655,248	$ 400,912,173	22.25%	$ 84,424,004
2010	218,388,037	80,947,311	137,440,726	400,404,320	20.22%	82,904,631
2011	250,056,273	82,869,839	167,186,434	425,385,354	19.48%	85,315,391
2012	271,505,718	81,521,883	189,983,835	418,964,763	19.46%	85,869,109
2013	294,877,895	103,669,015	191,208,880	416,491,784	24.89%	106,980,765
2014	304,265,411	107,334,399	196,931,012	460,189,982	23.32%	109,697,945
2015	323,544,987	236,104,362	87,440,625	465,231,594	50.75%	196,618,542
2016	333,952,291	154,101,396	179,850,895	478,470,944	32.21%	205,943,005
2017	372,845,121	228,452,611	144,392,510	469,407,281	48.67%	227,000,000 [a]
2018	412,220,284	249,684,038	162,536,246	456,969,301	54.64%	235,000,000 [a]

** The historical FABF Statutory Funding Policy does not conform to Actuarial Standards of Practice; therefore, the Actuarially Determined Contribution is equal to the normal cost plus an amount to amortize the unfunded liability using level dollar payments and a 30-year amortization period. Amounts for fiscal years prior to 2015 were based on the "ARC" which was equal to normal cost plus an amount to amortize the unfunded liability using a 30-year open period level dollar amortization.*

*** Covered payroll is the amount in force as of the valuation date and likely differs from actual payroll paid during the fiscal year.*

****Excludes amounts paid for health insurance supplement.*

[a] *Fixed statutory contributions of $227,000,000 for fiscal year end December 31, 2017, and $235,000,000 for fiscal year end December 31, 2018, exclude required City contribution for Exempt Rank funding.*

Notes to Schedule of Contributions

Valuation Date:	December 31, 2018

Methods and Assumptions Used to Determine Contribution Rates as of the Valuation Date:

Actuarial Cost Method	Entry Age Normal
Amortization Method	Prior to 2015, the total City contribution was generated by a tax equal to 2.26 times the contributions by the firemen to the Fund two years prior to the year of the tax levy. For tax levy years 2015-2019, the statutory contributions are equal $199 million, $208 million, $227 million, $235 million and $245 million respectively. For tax levy years on and after 2020, the statutory contributions are equal to a level percentage of pay contribution determined so that the Fund attains a 90 percent funded ratio by the end of 2055 on an open group basis.
Remaining Amortization Period	Not Applicable. An amortization payment is not directly calculated. The amortization payment is the difference between the total statutory contribution and the employer normal cost contribution.
Asset Valuation Method	5-year smoothed market
Inflation	2.25 percent
Salary Increases	Salary increase rates based on age-related productivity and merit rates plus wage inflation of 3.50 percent.
Postretirement Benefit Increases	A retiree born before January 1, 1966, with at least 20 years of service or receiving a mandatory retirement minimum annuity, receives an increase of 3 percent of the original annuity, starting on the first of the month following the first anniversary of his retirement or the first of the month following attainment of age 55, whichever is later, and shall not be subject to a 30 percent maximum increase. For retirees born on or after January 1, 1966, automatic increases are 1.5 percent of the original annuity, commencing at age 60, or the first anniversary of retirement, if later, to a maximum of 30 percent. For participants who first became members on or after January 1, 2011, increases are equal to the lesser of 3.00 percent and 50 percent of CPI-U of the original benefit, commencing at age 60.
Investment Rate of Return	6.75 percent as of the December 31, 2018, actuarial valuation.
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Last updated for the December 31, 2017, actuarial valuation pursuant to an experience study of the period January 1, 2012 through December 31, 2016.
Mortality	Post Retirement Mortality: Scaling factors of 106 percent for males, and 98 percent for females of the RP-2014 Blue Collar Healthy Annuitant mortality table, sex distinct, with generational mortality improvement using MP-2017 2-dimensional mortality improvement scales. Disabled Mortality: Scaling factors of 107 percent for males, and 99 percent for females of the RP-2014 Blue Collar Healthy Annuitant mortality table, sex distinct, with generational mortality improvement using MP-2017 2-dimensional mortality improvement scales. Pre-Retirement Mortality: Scaling factors of 92 percent for males, and 100 percent for females of the RP-2014 Blue Collar Employee mortality table, sex distinct, with generational mortality improvement using MP-2017 2-dimensional mortality improvement scales. Future mortality improvements in pre- and post-retirement mortality are reflected by projecting the base mortality tables back from the year 2014 to the year 2006 using the MP-2014 projection scale and projecting from 2006 using the MP-2017 projection scale.

Other Information:

Notes	The actuarial valuation is based on the statutes in effect as of December 31, 2018.

Methods and Assumptions Used for Accounting Purposes as of the Valuation Date:

Actuarial Cost Method	Entry Age Normal
Discount Rate	7.23 percent as of the December 31, 2017, actuarial valuation.
	6.61 percent as of the December 31, 2018, actuarial valuation.

SECTION D

NOTES TO FINANCIAL STATEMENTS

Auditor’s Note: This information is intended to assist in preparation of the financial statements of the Firemen's Annuity and Benefit Fund of Chicago. Financial statements are the responsibility of management, subject to the auditor’s review. Please let us know if the auditor recommends any changes.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

Single Discount Rate

A Single Discount Rate of 6.61 percent was used to measure the total pension liability. This Single Discount Rate was based on an expected rate of return on pension plan investments of 6.75 percent and a municipal bond rate of 3.71 percent. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates as specified by the Statutes. Based on these assumptions, the pension plan's fiduciary net position and future contributions were sufficient to finance the benefit payments only through the year 2072. As a result, the long-term expected rate of return on pension plan investments was applied to projected benefit payments through the year 2072, and the municipal bond rate was applied to all benefit payments after that date.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 6.61 percent, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher:

Sensitivity of Net Pension Liability To the Single Discount Rate Assumption

1% Decrease 5.61%	Current Single Discount Rate Assumption 6.61%	1% Increase 7.61%
$ 5,982,108,511	$ 5,216,570,046	$ 4,577,347,681

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	5,022
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	92
Active Plan Members[1]	4,487
Total Plan Members	9,601

[1]Includes six participants on ordinary disability who continue to accrue benefit service as of December 31, 2018.

Additional information about the member data used is included in the December 31, 2018, funding actuarial valuation report.

SECTION E

SUMMARY OF BENEFITS

Summary of Benefits

Plan Descriptions (as of December 31, 2018)

Participants

Person employed by the City of Chicago in its fire service as firefighter, fire paramedic, fire engineer, marine engineer or fire pilot, whose duty it is to participate in the work of controlling and extinguishing fire at the location of any such fire, whether or not he is assigned to fire service other than the actual extinguishing of fire.

Service

In computing service, the following periods shall be counted:

All periods of active service, vacation, leave of absence with whole or part pay, military service, periods of disability for which he receives disability benefit and leave of absence without pay to perform the duties of a member of the General Assembly prior to January 9, 1997. It is computed on a day-to-day basis. Employees may purchase the 1980-strike time and periods of suspension less than one year. Employees may purchase, with 4 percent interest, periods of employment of the Chicago Fire Department from 1970 until the employee entered this fund.

Retirement Annuity

Eligibility
For participants who first became members before January 1, 2011, attainment of age 50 with at least 10 years of service.

For participants who first became members on or after January 1, 2011, attainment of age 55 with at least 10 years of service. Participants may retire at attainment of age 50 with 10 years of service with a reduced benefit.

Mandatory
Retirement is mandatory for a participant who has attained age 63, except for emergency medical technicians.

Accumulation Annuity
At age 50 or more, with 10 or more years of service, the employee is entitled to an annuity based on the sums accumulated for age and service annuity plus 1/10 of the sum accumulated from the contributions by the City for the age and service annuity for each completed year of service after the first 10 years. At age 50 or more with 20 or more years or at age 63, the employee is entitled to an annuity based on all sums accumulated to his or her credit. The maximum is 75 percent of highest salary.

Minimum Formula Annuity
If the employee has 20 or more years of service (the annuity will begin no earlier than age 50), he or she is entitled to the following annuity: 50 percent plus 2.5 percent of the final average salary for each year or fraction of service over twenty years. Maximum is 75 percent of the final average salary.

Retirement at Age 63 with Less than 20 Years of Service[1]

An employee who reaches compulsory retirement age with less than 20 years but greater than 10 years of service shall be entitled to a minimum annuity equal to 30 percent of final average salary for the first 10 years of service plus an additional 2 percent for each year in excess of 10, not to exceed 50 percent of final average salary.

Minimum Annuity

The minimum monthly annuity is the greater of $1,050 or 125 percent of the Federal Poverty Level if the firefighter retired at age 50 or over with at least 20 years of service.

For participants who first became members on or after January 1, 2011, the member is entitled to an annuity based on an accrual rate of 2.5 percent of the final average salary for each fraction of service. Maximum is 75 percent of the final average salary. Final average salary is calculated using salary from the eight highest consecutive years within the last 10 years of service prior to retirement. Pensionable salary is limited to $106,800 in 2011, increased by the lesser of 3 percent and one-half of the annual unadjusted percentage increase in the Consumer Price Index-U (but not less than zero) as measured in the preceding 12-month period ending with the September preceding the November 1, which is the date that the new amount will be calculated and made available to the pension funds.

For participants who first became members on or after January 1, 2011, who retire after age 50 but before age 55 is attained, the member is entitled to an annuity based on an accrual rate of 2.5 percent of the final average salary for each fraction of service, reduced by one half of one percent per month for retirement prior to age 55, subject to a maximum benefit of 75 percent.

Automatic Increase in Annuity

If an employee qualifies for a minimum formula annuity, 1.5 percent of the original annuity, starting on the first of the month one year after retirement or the first of the month following attainment of age 60 (age 55 if born before January 1, 1966, effective November 29, 2016), whichever is later, with a maximum of 30 percent (20 years). Such increases shall be 3 percent for firefighters born before January 1, 1966, (effective November 29, 2016) and such firefighters shall not be subject to the 30 percent maximum increase.

For participants who first became members on or after January 1, 2011, increases are equal to the lesser of 3.00 percent and 50 percent of CPI-U of the original benefit, commencing at age 60.

Widow/Widower Annuity

Payable until remarriage if widow/widower remarries before age 60, except Compensation and Supplemental Annuities. If the annuity is suspended because the widow/widower remarries before age 60, annuity payments will be resumed if the subsequent marriage ends. Any widow/widower's annuity, which was suspended on account of remarriage prior to December 31, 1989, will be resumed, if subsequent marriage ends, the later of July 14, 1995, or when the marriage ended. Beginning January 16, 2004, widows retain their rights to benefits after remarriage at any age. Benefits are not available to a

[1] Between January 1994 and December 2000, benefits have been administered as if there were no compulsory retirement age. Beginning December 2000 benefits have been administered as if age 63 is the compulsory retirement age for non-EMT participants and there is no compulsory retirement age for EMT participants.

widow of a fireman who received a refund of contributions for widow's benefits, unless the refund is repaid with 4 percent interest per year.

Death in Service (Non-Duty)

(1) If the firefighter dies with at least 1.5 years of service, 30 percent of the salary attached to the rank of a first class firefighter in the classified career service at the time of the firefighter's death; or,

(2) 50 percent of the annuity the deceased firefighter would have received if he had retired just prior to the date of death; or,

(3) Money purchase based on the total salary deductions and City contributions for age and service annuity and widow/widower's annuity.

(4) The widow of an active fireman with 10 or more years of service will receive no less than 50 percent of the benefit that the active fireman would have received had they attained age 50 and 20 years of service.

Death In Service (Duty Related)

Compensation Annuity[2]

The annuity paid to the spouse equals 75 percent of the firefighter's salary attached to his civil service position at the time of his death. This amount increases as the salary of the position increases. This benefit is payable until the year in which the firefighter would have reached the compulsory retirement age.

Death In Service (Duty Disability)

Compensation Annuity

The annuity paid to the spouse of a member who dies in receipt of duty disability benefits equals 75 percent of the firefighter's salary attached to his civil service position at the time of his death. This amount increases as the salary of the position increases.

Death after Retirement

(1) If the firefighter dies after retirement, the annuity is 50 percent of the retirement annuity that the deceased firefighter was receiving at the time of his or her death; or

(2) Money purchase based on the sums accumulated for the spouse annuity plus 10 percent of the accumulated City contributions for each year of service from 10 to 20 years, and full accumulated City contributions after 20 years of service.

Maximum Annuity

No maximum dollar amount.

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[2] Between January 1994 and December 2000, benefits have been administered as if there were no compulsory retirement age. Beginning December 2000 benefits have been administered as if age 63 is the compulsory retirement age for non-EMT participants and there is no compulsory retirement age for EMT participants.

Minimum Annuity
The minimum monthly annuity for any widow/widower is the greater of $1,000 or 125 percent of the Federal Poverty Level.

For participants who first became members on or after January 1, 2011, widow benefits are equal to 66-2/3 percent of the firemen's earned annuity at the date of death. Automatic increases to the annuity are equal to the lesser of 3.00 percent and 50 percent of CPI-U, commencing when the survivor reaches age 60, and applied to the original granted retirement annuity.

Child Annuity

Upon the death of the firefighter, unmarried children less than age 18 (except where child is so physically or mentally handicapped as to be unable to support himself) are eligible to receive an annuity. The amount of annuity payable for a child is 10 percent of the current annual maximum salary of a first class firefighter while a widow/widower survives; 15 percent when no widow/widower survives.

Family Maximum

The total annuities for widow/widower and children cannot exceed 60 percent for non-duty death, or 100 percent for duty death, of the current maximum annual salary of a first class firefighter.

Parent Annuity

Parent's annuity is provided for each surviving parent of a firefighter who dies prior to separation from service, or while out of service with at least 20 years; provided there is no widow/widower or child and that the deceased firefighter was contributing to their support. The benefit is an amount equal to 18 percent of the current annual salary attached to the classified position held by the firefighter at the time of death.

Disabilities

Duty Disability Benefit[3]
Injury incurred in the performance of duty. The amount of the benefit is 75 percent of salary at the time the disability is allowed payable to employee's compulsory retirement age plus $30 per month for each unmarried child less than age 18 (except where the child is so physically or mentally handicapped as to be unable to support him/herself), but the total amount of child benefits shall not exceed 25 percent of salary. Effective January 1, 1994, the minimum benefit, if the employee has been on disability at least 10 years, is 50 percent of current salary at the rank held by the employee when he was removed from the Department payroll. Salary deductions are contributed by the City. There are no age or service requirements for retirement on money purchase annuity and receiving full contributions.

[3] Between January 1994 and December 2000, benefits have been administered as if there were no compulsory retirement age. Beginning December 2000 benefits have been administered as if age 63 is the compulsory retirement age for non-EMT participants and there is no compulsory retirement age for EMT participants.

***Occupational Disease Disability*[4]**

A firefighter who has 10 or more years of service and is unable to perform his or her duties by reason of heart disease, tuberculosis or any disease of the lungs or respiratory tract, resulting solely from his or her service as a firefighter. Occupational disease also includes disabling cancer of the type which may be caused by exposure to heat, radiation or a known carcinogen as defined by the International Agency for Research on Cancer. The amount of the benefit is 65 percent of salary at the time of the employee's removal from the Department payroll payable to compulsory retirement age plus $30 a month for each unmarried child less than age 18 (except where the child is so physically or mentally handicapped as to be unable to support him/ herself), but the total amount of child's benefits shall not exceed 25 percent of salary. Effective January 1, 1994, the minimum benefit, if the employee has been on disability at least 10 years, is 50 percent of current salary at the rank held by the employee when he or she was removed from Department payroll. Salary deductions are contributed by the City. There are no age or service requirements for retirement on money purchase annuity and receiving full contributions.

Ordinary Disability Benefit

Cause other than the performance of an act of duty, payable after 30 days for a period equal to 50 percent of total service (not including any previous O.D. time), but not to exceed five years. The disability benefit is 50 percent of salary at time of disability less pension deductions. When the disabled firefighter becomes eligible for the minimum formula annuity, the disability benefit shall cease, and he or she shall thereafter receive an annuity; however, there are no age or service requirements to retire on money purchase from disability prior to qualification for the minimum formula annuity if the disability then terminates.

Death Benefit

In active service, on an authorized leave of absence, if death occurs within 60 days of receipt of salary, receiving duty or ordinary disability benefit, occurring within 60 days of termination of such benefit, or occurring on retirement while in receipt of annuity and separation was effective after age 50 and application was made within 60 days from separation; payable to written beneficiaries or, if none, to estate.

[4] Between January 1994 and December 2000, benefits have been administered as if there were no compulsory retirement age. Beginning December 2000 benefits have been administered as if age 63 is the compulsory retirement age for non-EMT participants and there is no compulsory retirement age for EMT participants.

Summary of Benefits

Age	Death in Service After July 1, 1983	Death After Retirement After July 1, 1983
49 and under	$12,000	$6,000
50	11,600	6,000
51	11,200	6,000
52	10,800	6,000
53	10,400	6,000
54	10,000	6,000
55	9,600	6,000
56	9,200	6,000
57	8,800	6,000
58	8,400	6,000
59	8,000	6,000
60	7,600	6,000
61	7,200	6,000
62	6,800	6,000
63	6,400	6,000
64 and over	6,000	6,000

Refunds

To Firefighters

Of entire amount (excluding ordinary disability pension deductions) with interest at 4 percent if entered before June 30, 1953, and 3 percent otherwise, before age 50, or before age 57 and less than 10 years of service. A firefighter who receives a refund and who subsequently reenters the service shall not receive, nor his or her widow/widower or parents, any annuity benefit or pension unless the refund is repaid with 4 percent interest. Repayment must be made within two years after reentry.

For Widow/Widower Annuity

If the firefighter is not married when he retires on annuity, he or she will receive a refund of all his or her contributions, with interest, for spouse's annuity.

Refunds of Remaining Amounts

If amounts contributed by a firefighter (with interest) are not paid out to him or her, in the form of a refund or annuity, or his or her widow/widower in the form of annuity, the remaining amounts (with interest) shall be paid out to his or her heirs, or to administrator of estate, for burial expense. If there are children under age 18, amount necessary to pay children annuities will not be refunded. There will be no refund paid to a widow/widower whose annuity is suspended because of remarriage.

Summary of Benefits

Deductions and Contributions

	Deductions	City Contributions[1]
Employee	7.125 %	8.500 %
Spouse	1.500 %	2.000 %
Ordinary Disability	0.125 %	0.000 %
Annuity Increase	0.375 %	0.000 %
	9.125 %	10.500 %

[1] *Credited to participant's Accumulation Annuity and Widow's Annuity accounts*

Prior to 2015, the city shall levy a tax annually at a rate on the dollar of the assessed valuation of all taxable property that will produce an amount not to exceed the total amount of contributions by the firefighters to the Fund made in the calendar year two years prior multiplied by 2.26 for 1982 and each year thereafter, plus $142,000 for the Ordinary Death Benefit.

Under P.A. 99-0506, City contributions are equal to $199 million in payment year 2016, $208 million in payment year 2017, $227 million in payment year 2018, $235 million in payment year 2019 and $245 million in payment year 2020. For payment years after 2020, annual employer contributions combined with member contributions and other Fund revenue must equal the amount, as a level percentage of payroll, that is sufficient to produce 90 percent funding by the end of fiscal year 2055.

Death Benefit

Employees contribute $2.50 per month at the same time and with the same frequency as other deductions (with each payment of salary).

Tax Shelter of Employee Salary Deductions

Beginning January 1, 1982, employee contributions were designated for income tax purposes to be made by the employer. The W-2 salary is therefore reduced by the amount of contribution. For pension purposes the salary remains unchanged. Income tax will be paid when a refund or annuity is received. For the purpose of benefits, refunds or financing, these contributions will be treated as employee contributions.

Compulsory Retirement Age

Effective January 1, 1994, the federal law (ADEA) allowing compulsory retirement at age 63 lapsed. As such, duty disability and occupational disease disability benefits and widow/widower compensation benefits may be "open ended"; i.e., without limiting age.

Effective December 2000 the City of Chicago enacted a compulsory retirement age of 63 for non-EMT participants. As such, all disability benefits for non-EMT participants cease at age 63 and become payable as retiree benefits.

Compensation Widows

Beginning January 1, 2001, mandatory retirement will have no impact on Widow benefits. Therefore, effective with the December 31, 2001, valuation, all Supplemental Widows have been re-classified as Compensation Widows. The classification of Supplemental Widows has been discontinued.

Salary Cap and COLA Development for Members Hired on or after January 1, 2011

Year Ending	CPI-U	½ CPI-U	COLA	Maximum Annual Pensionable Earnings
2011			3.00%	$ 106,800.00
2012	3.90%	1.95%	1.95%	108,882.60
2013	2.00%	1.00%	1.00%	109,971.43
2014	1.20%	0.60%	0.60%	110,631.26
2015	1.70%	0.85%	0.85%	111,571.63
2016	0.00%	0.00%	0.00%	111,571.63
2017	1.50%	0.75%	0.75%	112,408.42
2018	2.20%	1.10%	1.10%	113,644.91
2019	2.30%	1.15%	1.15%	114,951.83

Section F

Actuarial Cost Method and Actuarial Assumptions

Actuarial Cost Method and Actuarial Assumptions

ACTUARIAL COST METHOD

An Actuarial Cost Method is a set of techniques used by the actuary to develop contribution levels under a retirement plan. The Actuarial Cost Method used in this actuarial valuation for statutory funding and State reporting purposes and GASB accounting purposes is the Entry Age Normal cost method.

Under the Entry Age Normal cost method, each participant's projected benefit is allocated on a level percent of pay basis from entry age to assumed exit age. The Actuarial Accrued Liability is the portion of the present value of benefits associated with pay prior to the actuarial valuation date. The Normal Cost is the present value of benefits associated with pay during the current plan year.

To the extent that current assets are less than the Actuarial Accrued Liability, an Unfunded Actuarial Accrued Liability ("UAAL") develops. The UAAL is generally amortized over a fixed period of time (e.g., 30 years) from the date incurred. The total contribution developed under this method is the sum of the Normal Cost and the payment toward the UAAL.

CURRENT ACTUARIAL ASSUMPTIONS

The current demographic actuarial assumptions were adopted and became effective December 31, 2017, and were based on results of the experience study performed for the period January 1, 2012 through December 31, 2016. Based on the December 31, 2018, Economic Assumption Review, the economic actuarial assumptions were adopted and became effective December 31, 2018. Key economic actuarial assumption changes include decreasing the discount rate and investment return assumption from 7.50 percent to 6.75 percent, decreasing the wage inflation rate from 3.75 percent to 3.50 percent, and decreasing the general inflation rate from 2.50 percent to 2.25 percent.

Demographic Assumptions

Mortality:

Post-Retirement Mortality: Scaling factors of 106 percent for males, and 98 percent for females of the RP-2014 Blue Collar Healthy Annuitant mortality table, sex distinct, with generational mortality improvement using MP-2017 2-dimensional mortality improvement scales recently released by the SOA. This assumption provides a margin for mortality improvements.

Disabled Mortality: Scaling factors of 107 percent for males, and 99 percent for females of the RP-2014 Blue Collar Healthy Annuitant mortality table, sex distinct, with generational mortality improvement using MP-2017 2-dimensional mortality improvement scales recently released by the SOA. This assumption provides a margin for mortality improvements.

Pre-Retirement Mortality: Scaling factors of 92 percent for males, and 100 percent for females of the RP-2014 Blue Collar Employee mortality table, sex distinct, with generational mortality improvement using MP-2017 2-dimensional mortality improvement scales recently released by the SOA. This assumption provides a margin for mortality improvements.

Future mortality improvements in pre- and post-retirement mortality are reflected by projecting the base mortality tables back from the year 2014 to the year 2006 using the MP-2014 projection scale and projecting from 2006 using the MP-2017 projection scale.

Age	Future Life Expectancy (years) in 2018		Future Life Expectancy (years) in 2030	
	Post-Retirement		Pos-Rretirement	
	Male	Female	Male	Female
35	47.57	51.82	48.90	53.04
40	42.47	46.58	43.75	47.78
45	37.46	41.44	38.70	42.61
50	32.56	36.39	33.77	37.53
55	27.83	31.47	29.00	32.58
60	23.34	26.77	24.42	27.81
65	19.14	22.29	20.11	23.23
70	15.27	18.01	16.11	18.88
75	11.73	14.04	12.48	14.84

Rate of Retirement: The tables below show the assumed rates of retirement.

Attained Age	Hired before January 1, 2011		Hired on or after January 1, 2011	
	Firefighters Rates	Paramedic Rates	Firefighters Rates	Paramedic Rates
50	0.02	0.03	0.01	0.01
51	0.02	0.03	0.01	0.01
52	0.02	0.03	0.01	0.01
53	0.02	0.04	0.01	0.01
54	0.04	0.08	0.01	0.01
55	0.12	0.08	0.13	0.08
56	0.12	0.10	0.13	0.10
57	0.13	0.10	0.14	0.10
58	0.13	0.12	0.14	0.12
59	0.16	0.12	0.16	0.12
60	0.20	0.15	0.20	0.15
61	0.25	0.15	0.25	0.15
62	0.60	0.20	0.60	0.20
63	1.00	0.30	1.00	0.30
64		0.40		0.40
65		1.00		1.00

Rate of Termination: The following are sample rates from the table:

Years of Service	Rate
0	0.020
1	0.008
2-8	0.006
9-13	0.005
14-29	0.004
30+	0.000

Rate of Disability: The rate at which members are assumed to become disabled under the provisions of the Fund. The rates assumed are as follows:

Attained Age	Rates
20-24	0.0009
25-29	0.0009
30-34	0.0010
35-39	0.0010
40-44	0.0018
45-49	0.0038
50-54	0.0106
55-59	0.0208
60-63	0.0250

Of the participants who become disabled, 55 percent are assumed to be duty disability, 40 percent are assumed to be occupational disease disability and 5 percent are assumed to be ordinary disability.

Economic Assumptions

Investment Return: 6.75 percent per year, compounded annually, net of investment expenses. The 6.75 percent assumption is composed of a 2.25 percent inflation assumption and a 4.50 percent real rate of return assumption. This assumption is first effective with the December 31, 2018, actuarial valuation.

General Inflation: 2.25 percent per year, compounded annually.

This assumption serves as the basis for the determination of annual increases in pension and the pensionable salary cap for Tier Two members.

Wage Inflation and Payroll Growth: 3.50 percent per year, compounded annually.

Future Salary Increases: The assumed base rate of individual salary increase is 3.50 percent per year (underlying wage inflation assumption), plus an additional percentage based on the following service scale:

Years of Service	Base Rates	Wage Inflation	Total Rates
0	21.50%	3.50%	25.00%
1	9.50%	3.50%	13.00%
2	5.75%	3.50%	9.25%
3	4.75%	3.50%	8.25%
4	4.75%	3.50%	8.25%
5	0.50%	3.50%	4.00%
6-8	0.00%	3.50%	3.50%
9	3.25%	3.50%	6.75%
10-13	0.00%	3.50%	3.50%
14	3.25%	3.50%	6.75%
15-18	0.00%	3.50%	3.50%
19	3.75%	3.50%	7.25%
20-23	0.00%	3.50%	3.50%
24	3.00%	3.50%	6.50%
25-28	0.00%	3.50%	3.50%
29	1.25%	3.50%	4.75%
30 and Over	0.00%	3.50%	3.50%

Asset Value: For State reporting, the actuarial value of assets is smoothed by using a five-year phase-in of each year’s unexpected investment gains and losses on the market value.

For the GASB Statement Nos. 67 and 68 Actuarially Determined Contribution, the actuarial value of assets is smoothed by using a five-year average market value.

Expenses: Future administrative expenses are assumed to increase at the assumed inflation assumption of 2.25 percent.

Other Assumptions and Provisions

Marital Status:	It is assumed that 75 percent of active members have an eligible spouse. The male spouse is assumed to be three years older than the female spouse. No assumption is made about other dependents.
Reciprocal Service:	No assumption for reciprocal service.
Military Service:	No assumption for military service.
Benefit Service:	Exact fractional years of service are used to determine the amount of benefit payable. After a participant has 20 years of service, future benefit service is increased to the nearest integer.
Decrement Timing:	All decrements are assumed to occur mid-year.
Decrement Relativity:	Decrement rates are used directly, without adjustment for multiple decrement table effects.
Decrement Operation:	Turnover decrements do not operate after member reaches retirement eligibility for a minimum annuity formula benefit.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.
Pay Increase Timing:	Beginning of the (fiscal) year.
Beneficiary COLA Approximation:	For current retirees, benefits for future survivors were increased by 35 percent to approximate the value of COLA benefits earned prior to the retirees death.

Projection Assumptions

Active Population: Active members who terminate, retire, become disabled or die during the year are replaced by new entrants such that the number of active members remains level during the projection period based on the most recent actuarial valuation. The number of active members as of the actuarial valuation at December 31, 2018, is 4,487.

New Entrant Profile: The entry age of future new entrants, which is summarized below, is based on the profile of current active members hired over the last five years with one or more years of service as of December 31, 2018. These members were hired from January 1, 2014 through December 31, 2017. The group hired due to the Lewis Settlement was excluded from the development of the new entrant profile.

Entry Age	Number
Less than 25	85
25 to 30	270
30 to 35	275
35 to 40	91
40 to 45	8
45 and Over	5

Approximately 90 percent of the new entrants are assumed to be male.

New Entrant Pay: Based on the most recent employment contract, new entrants were assumed to earn $56,304 for the plan year ending December 31, 2019. The new entrant pay for members hired after 2019 is assumed to increase by the wage inflation assumption of 3.50 percent.

New Entrant Pay Increases: Pay for a specific new entrant is assumed to increase in the future by the wage inflation and the service based salary increase assumptions.

The projections assume a pay cap of $113,644.91 for plan year 2018, and a pay cap of $114,951.83 for plan year 2019, increasing by 1.125 percent per year after plan year 2018. The annual increase of 1.125 percent per year is based on 50 percent of the CPI-U increase which is assumed to be 2.25 percent per year.

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate

GASB Statement Nos. 67 and 68 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed actuarial valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate ("SDR") is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.75 percent; the municipal bond rate is 3.71 percent; and the resulting Single Discount Rate is 6.61 percent.

The sponsor finances benefits using a funding policy defined in state statutes. Sponsor contributions are equal to a fixed payment schedule for payment years 2016 through 2020 and a level percentage of pay contribution determined so that the Fund attains a 90 percent funded ratio by the end of 2055 on an open group basis for payment years on and after 2021. The statutory contribution does not explicitly separate projected employer contributions between current plan members and future plan members.

For purposes of developing the Single Discount Rate, we have projected actuarial liabilities on an Entry Age Normal basis, and compared against projected market value of assets. We have assumed the actuarial liability for future members will be fully financed, to the extent that assets are available, any remaining asset will be assigned to current plan members. Based on this assignment of assets and employer contributions, plan assets assigned to current members are projected to be depleted by 2072.

The tables in this section provide background for the development of the Single Discount Rate.

The following tables show the assignment of assets and employer contributions and the projection of assets for current members as of the actuarial valuation date. Our projections assume the sponsor will make the required statutory contributions. The projections are based on the statutory funding projections performed during the December 31, 2018, actuarial valuation.

Total administrative expenses are assumed to increase at the assumed rate of inflation, or 2.25 percent. Total administrative expenses are allocated between current and future hires by total payroll.

Projection of Funded Status and Assignment of Assets

PYE 12/31	Open Group Actuarial Liability	Closed Group Actuarial Liability	Future Member Actuarial Liability	Open Group Assets	Future Member Assigned Assets	Closed Group Assigned Assets	Funded Ratio Current Members	Funded Ratio Future Members
	(a)	(b)	(c)=(a)-(b)	(d)	(e)=min[(c),(d)]	(f)=(d)-(e)	(g)=(f)/(b)	(h)=(e)/(c)
2018	$6,155,919,204	$6,155,919,204	$ -	$ 1,035,790,339	$ -	$ 1,035,790,339	16.83%	0.00%
2019	6,316,915,955	6,316,915,955	-	1,027,192,419	-	1,027,192,419	16.26%	0.00%
2020	6,471,743,422	6,467,452,826	4,290,596	1,128,873,811	4,290,596	1,124,583,215	17.39%	100.00%
2021	6,620,170,939	6,607,007,853	13,163,086	1,225,978,842	13,163,086	1,212,815,756	18.36%	100.00%
2022	6,763,225,623	6,736,097,896	27,127,727	1,322,820,432	27,127,727	1,295,692,705	19.24%	100.00%
2023	6,901,872,964	6,855,218,585	46,654,379	1,422,162,068	46,654,379	1,375,507,688	20.07%	100.00%
2024	7,035,933,152	6,963,548,798	72,384,354	1,524,778,221	72,384,354	1,452,393,867	20.86%	100.00%
2025	7,164,464,159	7,059,597,840	104,866,319	1,630,047,355	104,866,319	1,525,181,036	21.60%	100.00%
2026	7,286,322,339	7,141,617,897	144,704,442	1,736,491,742	144,704,442	1,591,787,300	22.29%	100.00%
2027	7,401,619,862	7,209,029,090	192,590,772	1,845,183,595	192,590,772	1,652,592,823	22.92%	100.00%
2028	7,511,898,208	7,262,810,514	249,087,694	1,959,499,085	249,087,694	1,710,411,391	23.55%	100.00%
2029	7,617,743,337	7,302,735,768	315,007,568	2,080,437,386	315,007,568	1,765,429,818	24.17%	100.00%
2030	7,718,852,443	7,328,259,537	390,592,906	2,206,745,489	390,592,906	1,816,152,583	24.78%	100.00%
2031	7,814,332,212	7,338,488,963	475,843,249	2,335,448,301	475,843,249	1,859,605,052	25.34%	100.00%
2032	7,904,188,422	7,332,962,067	571,226,355	2,466,898,696	571,226,355	1,895,672,340	25.85%	100.00%
2033	7,988,634,826	7,311,441,665	677,193,160	2,601,526,870	677,193,160	1,924,333,709	26.32%	100.00%
2034	8,068,122,092	7,273,858,523	794,263,569	2,739,824,614	794,263,569	1,945,561,045	26.75%	100.00%
2035	8,143,436,742	7,220,607,266	922,829,475	2,882,573,075	922,829,475	1,959,743,600	27.14%	100.00%
2036	8,215,102,353	7,151,768,862	1,063,333,491	3,030,452,942	1,063,333,491	1,967,119,451	27.51%	100.00%
2037	8,283,767,848	7,067,574,441	1,216,193,407	3,184,615,408	1,216,193,407	1,968,422,001	27.85%	100.00%
2038	8,350,115,088	6,968,306,749	1,381,808,340	3,346,523,800	1,381,808,340	1,964,715,460	28.20%	100.00%
2039	8,414,923,922	6,854,367,860	1,560,556,062	3,517,686,521	1,560,556,062	1,957,130,458	28.55%	100.00%
2040	8,478,771,175	6,726,120,932	1,752,650,243	3,699,170,805	1,752,650,243	1,946,520,562	28.94%	100.00%
2041	8,541,911,611	6,583,708,967	1,958,202,645	3,891,783,215	1,958,202,645	1,933,580,570	29.37%	100.00%
2042	8,604,704,180	6,427,460,490	2,177,243,691	4,096,830,715	2,177,243,691	1,919,587,024	29.87%	100.00%
2043	8,667,492,557	6,257,976,350	2,409,516,206	4,315,561,052	2,409,516,206	1,906,044,846	30.46%	100.00%
2044	8,730,575,399	6,076,026,725	2,654,548,674	4,549,367,073	2,654,548,674	1,894,818,399	31.19%	100.00%
2045	8,794,341,308	5,882,699,449	2,911,641,859	4,799,732,450	2,911,641,859	1,888,090,591	32.10%	100.00%
2046	8,859,207,452	5,679,318,554	3,179,888,898	5,068,374,323	3,179,888,898	1,888,485,425	33.25%	100.00%
2047	8,925,712,785	5,467,458,257	3,458,254,528	5,357,164,484	3,458,254,528	1,898,909,955	34.73%	100.00%
2048	8,994,601,091	5,249,022,681	3,745,578,410	5,667,766,021	3,745,578,410	1,922,187,611	36.62%	100.00%
2049	9,066,812,025	5,026,227,140	4,040,584,885	6,002,658,198	4,040,584,885	1,962,073,313	39.04%	100.00%
2050	9,143,162,720	4,801,239,754	4,341,922,966	6,364,192,877	4,341,922,966	2,022,269,911	42.12%	100.00%
2051	9,223,925,195	4,575,574,313	4,648,350,883	6,754,163,842	4,648,350,883	2,105,812,960	46.02%	100.00%
2052	9,309,364,876	4,350,510,579	4,958,854,297	7,174,377,121	4,958,854,297	2,215,522,824	50.93%	100.00%
2053	9,399,794,026	4,127,258,830	5,272,535,196	7,626,802,870	5,272,535,196	2,354,267,674	57.04%	100.00%
2054	9,495,668,513	3,906,892,355	5,588,776,158	8,113,657,286	5,588,776,158	2,524,881,128	64.63%	100.00%
2055	9,597,640,172	3,690,523,807	5,907,116,365	8,637,490,294	5,907,116,365	2,730,373,929	73.98%	100.00%
2056	9,706,286,003	3,479,096,898	6,227,189,105	8,735,657,661	6,227,189,105	2,508,468,556	72.10%	100.00%
2057	9,822,187,379	3,273,398,656	6,548,788,723	8,839,968,610	6,548,788,723	2,291,179,887	69.99%	100.00%
2058	9,945,779,964	3,073,994,904	6,871,785,060	8,951,201,672	6,871,785,060	2,079,416,612	67.65%	100.00%
2059	10,077,514,752	2,881,309,138	7,196,205,614	9,069,763,009	7,196,205,614	1,873,557,395	65.02%	100.00%
2060	10,217,791,348	2,695,600,452	7,522,190,896	9,196,012,286	7,522,190,896	1,673,821,391	62.09%	100.00%
2061	10,366,876,494	2,516,950,829	7,849,925,665	9,330,189,007	7,849,925,665	1,480,263,342	58.81%	100.00%
2062	10,524,985,618	2,345,412,313	8,179,573,305	9,472,486,688	8,179,573,305	1,292,913,384	55.13%	100.00%
2063	10,692,261,547	2,181,006,493	8,511,255,054	9,623,035,578	8,511,255,054	1,111,780,524	50.98%	100.00%
2064	10,868,765,808	2,023,711,940	8,845,053,868	9,781,889,058	8,845,053,868	936,835,190	46.29%	100.00%
2065	11,054,455,128	1,873,490,289	9,180,964,839	9,949,009,535	9,180,964,839	768,044,695	41.00%	100.00%
2066	11,249,199,202	1,730,274,321	9,518,924,881	10,124,279,236	9,518,924,881	605,354,356	34.99%	100.00%
2067	11,452,762,277	1,593,961,694	9,858,800,583	10,307,486,237	9,858,800,583	448,685,654	28.15%	100.00%
2068	11,664,808,967	1,464,420,388	10,200,388,579	10,498,327,799	10,200,388,579	297,939,220	20.35%	100.00%
2069	11,884,928,863	1,341,514,702	10,543,414,161	10,696,436,410	10,543,414,161	153,022,249	11.41%	100.00%
2070	12,112,660,377	1,225,109,514	10,887,550,863	10,901,394,586	10,887,550,863	13,843,723	1.13%	100.00%
2071	12,347,499,809	1,115,073,323	11,232,426,485	11,112,749,629	11,112,749,629	-	0.00%	98.93%
2072	12,588,933,099	1,011,280,537	11,577,652,562	11,330,039,602	11,330,039,602	-	0.00%	97.86%

The projections in this report are strictly for the purpose of determining the GASB Single Discount Rate and are different from a funding projection for the ongoing plan.

Current Member Projection of Assets and Assignment of Employer Contributions

PYE 12/31	Assets (boy)	Member Contributions	Administrative Expenses	Benefit Payments	Assigned Employer/City Contribution	Income on Asset and Cash Flow	Assets (eoy)
2019	$ 1,035,790,339	$ 42,556,506	$ 3,359,025	$ 348,197,359	$ 245,000,000	$ 55,401,958	$ 1,027,192,419
2020	1,027,192,419	42,316,362	3,298,970	364,885,211	368,977,775	54,280,840	1,124,583,215
2021	1,124,583,215	41,054,303	3,224,562	381,680,805	373,969,556	58,114,048	1,212,815,756
2022	1,212,815,756	39,831,518	3,137,973	397,433,469	380,194,132	63,422,742	1,295,692,705
2023	1,295,692,705	38,749,712	3,046,648	412,403,203	388,135,676	68,379,447	1,375,507,688
2024	1,375,507,688	37,589,302	2,949,717	427,395,201	396,545,175	73,096,620	1,452,393,867
2025	1,452,393,867	36,309,887	2,842,698	442,871,458	404,603,123	77,588,315	1,525,181,036
2026	1,525,181,036	34,805,327	2,730,716	458,769,140	411,512,687	81,788,105	1,591,787,300
2027	1,591,787,300	33,240,356	2,609,466	474,267,523	418,840,059	85,602,098	1,652,592,823
2028	1,652,592,823	31,829,850	2,488,524	488,312,336	427,718,886	89,070,691	1,710,411,391
2029	1,710,411,391	30,343,552	2,375,296	501,615,654	436,333,141	92,332,685	1,765,429,818
2030	1,765,429,818	28,783,869	2,254,643	514,399,646	443,167,890	95,425,294	1,816,152,583
2031	1,816,152,583	27,121,513	2,137,392	526,893,190	447,096,702	98,264,836	1,859,605,052
2032	1,859,605,052	25,482,734	2,026,892	538,892,035	450,822,621	100,680,860	1,895,672,340
2033	1,895,672,340	23,872,034	1,917,987	550,177,194	454,258,050	102,626,466	1,924,333,709
2034	1,924,333,709	22,238,916	1,810,685	560,462,542	457,152,057	104,109,590	1,945,561,045
2035	1,945,561,045	20,626,399	1,704,931	569,406,461	459,522,102	105,145,445	1,959,743,600
2036	1,959,743,600	19,029,464	1,599,675	577,311,456	461,507,689	105,749,829	1,967,119,451
2037	1,967,119,451	17,465,519	1,491,498	584,076,838	463,464,934	105,940,433	1,968,422,001
2038	1,968,422,001	15,957,888	1,385,256	589,723,995	465,684,311	105,760,510	1,964,715,460
2039	1,964,715,460	14,463,783	1,278,613	594,061,529	468,009,477	105,281,880	1,957,130,458
2040	1,957,130,458	12,986,605	1,170,416	597,182,871	470,176,172	104,580,615	1,946,520,562
2041	1,946,520,562	11,511,407	1,059,928	599,298,016	472,195,089	103,711,456	1,933,580,570
2042	1,933,580,570	10,058,630	945,373	600,273,124	474,440,021	102,726,299	1,919,587,024
2043	1,919,587,024	8,662,862	831,999	599,935,889	476,851,308	101,711,540	1,906,044,846
2044	1,906,044,846	7,339,357	720,144	598,196,936	479,578,020	100,773,256	1,894,818,399
2045	1,894,818,399	6,106,732	612,903	594,833,159	482,568,885	100,042,637	1,888,090,591
2046	1,888,090,591	4,981,619	510,993	589,719,462	485,971,074	99,672,596	1,888,485,425
2047	1,888,485,425	3,980,303	417,660	582,730,085	489,749,655	99,842,317	1,898,909,955
2048	1,898,909,955	3,116,755	333,461	573,663,667	493,402,268	100,755,761	1,922,187,611
2049	1,922,187,611	2,421,214	261,924	562,382,185	497,490,933	102,617,664	1,962,073,313
2050	1,962,073,313	1,887,423	206,371	549,041,984	501,891,274	105,666,256	2,022,269,911
2051	2,022,269,911	1,454,154	162,976	534,286,497	506,408,003	110,130,365	2,105,812,960
2052	2,105,812,960	1,085,166	124,666	518,370,089	510,910,601	116,208,853	2,215,522,824
2053	2,215,522,824	779,263	92,282	501,435,709	515,404,039	124,089,539	2,354,267,674
2054	2,354,267,674	526,823	65,140	483,674,382	519,866,853	133,959,300	2,524,881,128
2055	2,524,881,128	329,435	42,347	465,116,429	524,313,292	146,008,851	2,730,373,929
2056	2,730,373,929	186,274	25,546	445,993,005	63,493,488	160,433,415	2,508,468,556
2057	2,508,468,556	89,724	13,191	426,501,048	55,068,888	154,066,957	2,291,179,887
2058	2,291,179,887	34,248	5,631	406,895,181	54,908,348	140,194,941	2,079,416,612
2059	2,079,416,612	8,207	1,601	387,332,076	54,913,814	126,552,439	1,873,557,395
2060	1,873,557,395	643	137	367,981,345	54,945,766	113,299,068	1,673,821,391
2061	1,673,821,391	-	-	349,015,711	55,011,706	100,445,957	1,480,263,342
2062	1,480,263,342	-	-	330,461,726	55,116,147	87,995,621	1,292,913,384
2063	1,292,913,384	-	-	312,351,423	55,269,628	75,948,935	1,111,780,524
2064	1,111,780,524	-	-	294,727,845	55,477,615	64,304,897	936,835,190
2065	936,835,190	-	-	277,605,989	55,754,576	53,060,918	768,044,695
2066	768,044,695	-	-	261,011,272	56,107,235	42,213,697	605,354,356
2067	605,354,356	-	-	244,973,297	56,546,150	31,758,445	448,685,654
2068	448,685,654	-	-	229,514,101	57,078,719	21,688,947	297,939,220
2069	297,939,220	-	-	214,628,624	57,713,117	11,998,536	153,022,249
2070	153,022,249	-	-	200,307,440	58,447,795	2,681,119	13,843,723
2071	13,843,723	-	-	186,538,217	178,963,505	(6,269,011)	-
2072	-	-	-	173,306,642	182,154,616	(8,847,974)	-

The projections in this report are strictly for the purpose of determining the GASB Single Discount Rate and are different from a funding projection for the ongoing plan.

Development of Single Discount Rate

PYE 12/31	Benefit Payments	Discount Rate	Discounted Benefit Payment	Single Discount Rate	Discounted Benefit Payment
2019	$ 348,197,359	6.75%	$ 337,009,024	6.61%	$ 337,231,531
2020	364,885,211	6.75%	330,829,658	6.61%	331,485,373
2021	381,680,805	6.75%	324,175,814	6.61%	325,247,399
2022	397,433,469	6.75%	316,210,906	6.61%	317,675,232
2023	412,403,203	6.75%	307,373,592	6.61%	309,204,889
2024	427,395,201	6.75%	298,405,128	6.61%	300,579,508
2025	442,871,458	6.75%	289,658,614	6.61%	292,154,664
2026	458,769,140	6.75%	281,083,316	6.61%	283,879,959
2027	474,267,523	6.75%	272,205,173	6.61%	275,276,621
2028	488,312,336	6.75%	262,544,425	6.61%	265,857,578
2029	501,615,654	6.75%	252,643,601	6.61%	256,169,744
2030	514,399,646	6.75%	242,700,124	6.61%	246,412,548
2031	526,893,190	6.75%	232,875,628	6.61%	236,750,088
2032	538,892,035	6.75%	223,118,373	6.61%	227,130,121
2033	550,177,194	6.75%	213,387,154	6.61%	217,510,866
2034	560,462,542	6.75%	203,631,235	6.61%	207,840,592
2035	569,406,461	6.75%	193,799,347	6.61%	198,066,749
2036	577,311,456	6.75%	184,065,422	6.61%	188,366,975
2037	584,076,838	6.75%	174,447,253	6.61%	178,759,849
2038	589,723,995	6.75%	164,996,627	6.61%	169,298,924
2039	594,061,529	6.75%	155,700,430	6.61%	159,971,359
2040	597,182,871	6.75%	146,621,562	6.61%	150,842,441
2041	599,298,016	6.75%	137,836,887	6.61%	141,992,189
2042	600,273,124	6.75%	129,331,297	6.61%	133,406,171
2043	599,935,889	6.75%	121,085,375	6.61%	125,065,426
2044	598,196,936	6.75%	113,100,142	6.61%	116,972,026
2045	594,833,159	6.75%	105,352,841	6.61%	109,103,430
2046	589,719,462	6.75%	97,842,752	6.61%	101,459,823
2047	582,730,085	6.75%	90,569,664	6.61%	94,041,919
2048	573,663,667	6.75%	83,522,748	6.61%	86,839,396
2049	562,382,185	6.75%	76,702,780	6.61%	79,853,951
2050	549,041,984	6.75%	70,148,311	6.61%	73,126,673
2051	534,286,497	6.75%	63,946,677	6.61%	66,749,784
2052	518,370,089	6.75%	58,118,692	6.61%	60,746,464
2053	501,435,709	6.75%	52,665,143	6.61%	55,119,051
2054	483,674,382	6.75%	47,587,536	6.61%	49,870,643
2055	465,116,429	6.75%	42,868,069	6.61%	44,984,093
2056	445,993,005	6.75%	38,506,355	6.61%	40,460,453
2057	426,501,048	6.75%	34,495,034	6.61%	36,293,445
2058	406,895,181	6.75%	30,828,411	6.61%	32,478,506
2059	387,332,076	6.75%	27,490,597	6.61%	29,000,292
2060	367,981,345	6.75%	24,465,755	6.61%	25,843,428
2061	349,015,711	6.75%	21,737,516	6.61%	22,991,891
2062	330,461,726	6.75%	19,280,497	6.61%	20,420,026
2063	312,351,423	6.75%	17,071,539	6.61%	18,104,395
2064	294,727,845	6.75%	15,089,764	6.61%	16,023,858
2065	277,605,989	6.75%	13,314,420	6.61%	14,157,291
2066	261,011,272	6.75%	11,726,942	6.61%	12,485,789
2067	244,973,297	6.75%	10,310,421	6.61%	10,992,106
2068	229,514,101	6.75%	9,048,970	6.61%	9,659,995
2069	214,628,624	6.75%	7,927,012	6.61%	8,473,456
2070	200,307,440	6.75%	6,930,285	6.61%	7,417,806
2071	186,538,217	6.75%	6,045,802	6.61%	6,479,651
2072	173,306,642	6.75%	5,261,789	6.61%	5,646,826
2082	68,213,184	3.71%	6,749,289	6.61%	1,171,957
2092	14,284,131	3.71%	981,832	6.61%	129,405
2102	945,796	3.71%	45,162	6.61%	4,518
2112	7,592	3.71%	252	6.61%	19
2117	189	3.71%	5	6.61%	0
Total Present Value			**$ 7,164,110,578**		**$ 7,164,110,578**

The projections in this report are strictly for the purpose of determining the GASB Single Discount Rate and are different from a funding projection for the ongoing plan.

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Accrued Liability ("AAL")	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value ("APV")	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability and related actuarial present value of projected benefit payments for pensions.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution ("ADC") or Annual Required Contribution ("ARC")	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.

Glossary of Terms

Amortization Method	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year.
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered-Employee Payroll	The payroll of employees that are provided with pensions through the pension plan.
Deferred Inflows and Outflows	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
Deferred Retirement Option Program ("DROP")	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
Discount Rate	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: 1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and 2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

Entry Age Actuarial Cost Method ("EAN")	The EAN is a cost method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.
Fiduciary Net Position	The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.
GASB	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
Long-Term Expected Rate of Return	The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.
Money-Weighted Rate of Return	The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.
Multiple-Employer Defined Benefit Pension Plan	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Municipal Bond Rate	The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.
Net Pension Liability ("NPL")	The NPL is the liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities	Non-employer contributing entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contributing entities.
Normal Cost	The portion of the actuarial present value allocated to a valuation year is called the normal cost. For purposes of application to the requirements of this Statement, the term normal cost is the equivalent of service cost.

Glossary of Terms

Other Postemployment Benefits ("OPEB")	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
Total Pension Expense	The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year: 1. Service Cost 2. Interest on the Total Pension Liability 3. Current-Period Benefit Changes 4. Employee Contributions (made negative for addition here) 5. Projected Earnings on Plan Investments (made negative for addition here) 6. Pension Plan Administrative Expense 7. Other Changes in Plan Fiduciary Net Position 8. Recognition of Outflow (Inflow) of Resources due to Liabilities 9. Recognition of Outflow (Inflow) of Resources due to Assets
Total Pension Liability ("TPL")	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability ("UAAL")	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statement Nos. 67 and 68, the valuation assets are equal to the market value of assets.